DAYTIME RUNNING LIGHT MODULE AND SYSTEM

FIELD OF THE INVENTION

[0001] The present invention relates to automotive headlamp arrangements, and, more particularly, to a module for generating high-intensity daytime running lights on a vehicle utilizing existing components on the vehicle.

BACKGROUND OF THE INVENTION

[0002] It is well known that automobiles that have daytime running lights provide a safer means of transportation than no lights at all. As a matter of fact, the governments of at least six nations have made it mandatory for all automobiles to have daytime running lights that are continuously lit whenever the car is in operation. Numerous studies have proven a statistical significance in the reduction of multi-vehicle daytime accidents through the use of daytime running lights. In addition, studies have shown that there is a significant reduction in daytime head-on and front corner collisions among cars with daytime running lights. Moreover, in a comparison between vehicles having daytime running lights and vehicles not having daytime running lights, it has been shown that the costs of repair for vehicles involved in similar collisions are less with vehicles having daytime running lights than vehicles not having daytime running lights. Such results indicate that daytime running lights aid drivers in avoiding collisions, or at least reducing the impact of collisions.

[0003] Various proposals have been made for incorporating daytime running lights into vehicles. One such proposal requires the addition of separate daytime running lights installed on

a vehicle that are completely independent from the normal nighttime headlamps. Another proposal is simply to include a resistance in the circuit feeding the normal headlights, such that the resistance may be inserted during the daytime, and removed at night when brighter headlights are required. Both of these prior proposals are expensive and difficult to incorporate into vehicle designs. Specifically, the first proposal requires the provision of an entirely separate set of lights on the vehicle, which requires redesign of the vehicle in the front grille area. The second proposal requires the provision of a resistance, and also the energy wasted in heat through that same resistance.

[0004] It has also been proposed that the normal or standard headlamps of a car, which are normally connected to the battery in parallel for nighttime operation, be capable of connection in series during the daytime, so that each headlamp will "see" only half of the voltage provided. This will considerably reduce the brightness of each headlamp, and will not seriously decrease the life of the filament being utilized for the daytime lights. In addition, most all conventional daytime running light assemblies will shut the safety lighting in question off when the parking lights and/or head lights of the vehicle are turned on.

[0005] While these designs offer means for providing running lights during daylight hours, it is desirable to have a system which operates automatically, not requiring the operator to remember a new operational procedure, or to perform some task which he does not normally perform. Additionally, a system with universal installation applications and no vehicle age limits, ranging from existing semi-tractor trailers, buses, and fleet vehicles to personal and recreational-use private vehicles could be highly beneficial to automotive safety. Additional advantages might be realized in terms of fleet liability and insurance coverage with respect to medium and large corporations, should same corporate fleets be so equipped.

SUMMARY OF THE INVENTION

[0006] The present invention provides a daytime running light module for controlling the illumination of conventional American and imported vehicle parking lights/turn lights. The daytime running light module includes a pair of switches that are to be interconnected between the front vehicular lights and a power source to control the light emitted from the lights of the vehicle. That is, the module operates to control when one filament of a two filament bulb or system is illuminated, such that the brighter filament or bulb will be illuminated when the operator wishes to draw attention to the vehicle for safety purposes. The module may either automatically or manually control the light output as desired by the operator.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] A daytime running light module and system embodying the features of the present invention is depicted in the accompanying drawings which form a portion of this disclosure and wherein:

[0008] Figure 1 is a schematic drawing of a connection of parking lights/turn signal lights of a conventional domestic vehicle of the prior art;

[0009] Figure 2 is a schematic drawing of one embodiment of the daytime running light module of the present invention;

[0010] Figure 3 is a schematic drawing of another embodiment of the manually operated daytime running light module of the present invention;

[0011] Figure 4 is a schematic drawing of another embodiment of the automatically operated daytime running light module of the present invention;

[0012] Figure 5 is a schematic drawing of connection of parking lights/turn signal lights of a conventional import vehicle of the prior art;

[0013] Figure 6 is a schematic drawing of connection of parking lights/turn signal lights of some luxury vehicles of the prior art;

[0014] Figure 7 is a schematic drawing of another embodiment of the daytime running light module of the present invention;

[0015] Figure 8 is a schematic drawing of another embodiment of the daytime running light module of the present invention;

[0016] Figure 9 is a schematic drawing of another embodiment of the daytime running light module of the present invention;

[0017] Figure 10 is a schematic drawing of another embodiment of the daytime running light module of the present invention; and

[0018] Figure 11 is a schematic drawing of another embodiment of the manually operated daytime running light module of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0019] Referring now to Figure 1, a conventional connection between a power source **12** and a set of automotive lights **11**, **14**, and **16** in a vehicle is illustrated. The power source **12** is a conventional vehicular power source, such as a 12-volt battery. The set of lights includes a pair of headlights **11** and a pair of front vehicular lights **14**, **16** having dual filament bulbs. Traditional American and many import vehicle designs include a pair of front vehicular lights **14, 16** that are considered the front parking/turning lights. These front vehicular lights **14, 16** are conventionally integrated into the vehicle generally at the front right corner and the front left

corner of the vehicle. The position of the front vehicular lights **14, 16** allow the operator to provide visible signals in traffic to other vehicles in close proximity to same vehicle concerning the operator's intentions in operation of that vehicle. For example, the right front vehicle light **14** is visible on the right side of the vehicle, and the left front vehicle light **16** is visible on the left side of the vehicle.

[0020] The first vehicular light **14** corresponds to the right side of the vehicle, and includes filaments **14a** and **14b**. The second vehicular light **16** corresponds to the left side of the vehicle, and includes filaments **16a** and **16b.** Each filament **14a**, **14b**, **16a**, and **16b** of the respective bulbs **14, 16** has a unique brightness corresponding to either a low intensity light or a high intensity light. In particular, the respective first filaments **14a, 16a** have a brighter illumination than the second filaments **14b, 16b** since they are conventionally used as turn signal directional lights, and the respective second filaments **14b, 16b** having a softer illumination than the first filaments **14a, 16a** since they are conventionally used as parking lights. The energized turn signal filament in a conventional vehicle bulb is characteristically designed to be approximately three times as bright as an energized parking light filament of that same bulb. Consequently, the flashing turn signal light has a high contrast, greater than the energized parking light during night operation of a vehicle, especially since both light sources in this case are emitting light from the same location and the same lamp housing.

[0021] Continuing to view Figure 1, the power source **12** is connected to the headlights **11** and second dim filaments **14b, 16b** of the vehicular lights **14, 16** via a parking/headlight switch **18** of the vehicle. That is, the parking/headlight switch **18** of the vehicle will determine when the headlights **11** and the dim filaments **14b, 16b** are connected to the power source **12**. On the other hand, the power source **12** is connected to the first bright filaments **14a, 16a** of the

vehicular lights **14, 16** via a turn signal switch **20**, an ignition key switch **13**, and a variable load thermal flasher **21**. The negative connectors of lights **14, 16** are grounded at vehicle chassis ground **25**.

[0022] The ignition key switch **13** is the same that typically starts the engine of the vehicle. With respect to the first bright filaments **14a**, **16a** of the vehicular lights **14**, **16**, the power source **12** will only connect to voltage if the ignition key switch **13** of the vehicle is energized, or in an "on" position (i.e., when the ignition key of the vehicle is in the "run" position).

[0023] The first filament **14a, 16a** of each vehicular light **14, 16** is connected to the turn signal switch **20** via a respective turn signal connector **19a, 19b,** while the second filament **14b, 16b** of each vehicular light **14, 16** is connected to the conventional parking/headlight switch **18** via a respective parking light connector **17a, 17b.** The turn signal switch **20** is a single pole, double throw switch that has a center off or "rest" position. The turn signal switch **20** may complete the circuit at turn signal connector **20a** for a right directional signal, or may complete the circuit at turn signal connector **20b** for a left directional signal, as desired by the vehicle operator. The parking/headlight switch **18** is a double pole, triple throw switch with an "off" position. In operation, when the parking/headlight switch **18** is closed to either a parking light only position **18a** or a headlight-plus-parking light position **18b**, the parking/headlight switch **18** will connect the second filaments **14b** and **16b** with the power source **12** such that the second filament **14b, 16b** will be energized. Also, when the turn signal switch **20** is activated for a right direction turn through connector **20a**, the first filament **14a** of the right vehicular light **14** is connected with the power source **12** (through the thermal flasher **21** and ignition key switch **13,** discussed below) such that the first filament **14a** will be alternately energized and de-energized, in a pulsing on/off fashion. Similarly, when the turn-signal switch **20** is activated for a left

directional turn through connector **20b**, the first filament **16a** of the vehicular light **16** is connected with the power source **12** through thermal flasher **21** and ignition key switch **13** such that the first filament **16a** will be alternately energized on and off in like manner. The thermal flasher **21** generates the alternating on/off flashing voltage sent to the first filament **14a** when the turn signal switch **20** is actuated to indicate a right turn directional signal, and the thermal flasher **21** generates an identical but redirected alternating on/off flashing voltage to the first filament **16a** when the turn signal switch **20** is actuated to indicate a left turn directional signal.

[0024] The thermal flasher **21** is considered a variable load device, and accomplishes the on/off flashing 12-volt output due to its load transferring and carrying capabilities. The primary conventional flasher design has only two contacts, one contact is connected to the power source **12** through the ignition key switch **13,** while the other contact will not initiate "flashing" without current being drawn from the output connector of the thermal flasher **21** (traveling on to the input of the turn signal switch **20**, and connecting to either right turn connector **20a** or left turn connector **20b**). Without any resistive load for the thermal flasher **21** to sense, the thermal flasher **21** will not flash at all. As the current flow rate of the flasher **21** changes, the rate of flash of a conventional flasher usually also changes, hence why it is also known as a variable load flasher.

[0025] Looking now to Figure 2, a schematic diagram of one embodiment of the present invention of the daytime running module **22** is illustrated. The daytime running module **22** is electrically connected to the parking light connector **17a, 17b** and the turn signal connector **19a, 19b,** between the power source **12** and the vehicular lights **14, 16.** As a result, the daytime running light module **22** controls the intensity of the light produced by the vehicular lights **14, 16.** In particular, the daytime running light module **22** includes a pair of light intensity switches

30, 50 that are interconnected between the front vehicular directional lights **14, 16** and the power source **12**, controlling the light emitted from the vehicular lights **14, 16**, but only when the ignition key switch **13** is in the ignition "on" or "run" position, as would be needed while driving in the daytime.

[0026] Each light intensity switch **30, 50** preferably comprises a relay, and, more specifically, a four pole, double throw relay. The first light intensity switch **30** is connected between the first vehicular light **14** and both the parking/headlight switch **18,** and the right hand connector **20a** of turn signal switch **20**. Likewise, the second light intensity switch **50** is connected between the second vehicular light **16** and both the parking/headlight switch **18** and the left hand connector **20b** of turn-signal switch **20**. Also, each light intensity switch **30, 50** has an electromagnetic coil **30a, 50a**, with one end of each coil connected to ground **27**. Energizing the other end of coil **30a, 50a** causes the respective light intensity switch **30, 50** to energize and switch four sets of contacts, with their terminals conventionally described as "common", "normally closed", and "normally open". The switch sets **30b, 30c, 30d, 30e** and **50b, 50c, 50d, 50e** typically connect the "common" terminal to a matching "normally closed" terminal when the corresponding switch is not energized. They also connect the "common" terminal to a matching "normally open" terminal when the corresponding switch is energized. The corresponding switch contacts "close" when a voltage trigger is applied and maintained at the coil **30a** or the coil **50a** of the corresponding light intensity switch **30** or **50**.

[0027] In the embodiment shown in Figure 2, the first light intensity switch **30** is a four pole, double throw switch such that is able to make and/or break potentially four connections between the first vehicular light **14** and both the parking/headlight switch **18** and the right turn connector **20a** of the directional turn signal switch **20**. All connections from the front lights **14, 16** and the

light intensity switch **30, 50** are made using a four-strand, 18 gauge shielded cable **23**. The first light intensity switch **30** is connected to the parking/headlight switch **18** via a parking light input connector **32** and parking light connector **17a,** and it is connected to the second dimmer filament **14b** via a parking light output connector **34**. The first light intensity switch **30** is connected to the right turn connector **20a** of the turn signal switch **20** through turn signal input connector **36** and turn signal connector **19a**, and it is connected to the first brighter filament **14a** through turn signal output connector **38**. When the first light intensity switch **30** is not energized (i.e., turned "off"), the light intensity switch **30** connects the turn signal input connector **36** with the turn signal output connector **38** via circuit path connector **33** and the "normally closed" switched contact sets **30c** and **30d** of light intensity switch **30.** Also, when the first light intensity switch **30** is "off", the light intensity switch **30** connects the parking light input connector **32** with the parking light output connector **34** using the "normally closed" switched contact set **30b** of light intensity switch **30.** As a result, the first light intensity switch **30** in the non-energized state connects the first brighter light filament **14a** to its original turn signal connector **19a**, and connects first dimmer light filament **14b** to its original parking light connector **17a**. Hence, right vehicle light **14** is reconnected to its former vehicle connections while the intensity light switch **30** is "off".

[0028] When the first light intensity switch **30** is energized (i.e., turned "on"), the turn signal output connector **38** is connected to the power source **12**; through ignition key switch **13** and fuse **15**, then through main power circuit connector **70**, through the "normally closed" switched contact set **40b** of turn signal interrupt switch **40**, then through circuit path connector **35** and finally through the "normally open" switched contact set **30d** of light intensity switch **30**. As a result, when light intensity switch **30** is energized, the first brighter filament **14a** will be lit as

long as the ignition key switch **13** is energized or activated, and the turn signal interrupt switch **40** remains non-energized (i.e. stays "off"). Also, when the first light intensity switch **30** is energized, the parking light output connector **34** is connected to turn signal input connector **36** using the circuit path connector **31** and the "normally open" switched contact sets **30b** and **30c** of light intensity switch **30.** This results in the right turn signal connector **20a** of the turn signal switch **20** being connected to the first dimmer filament **14b** when the first light intensity switch **30** is energized. The first dimmer filament **14b** waits in the ready state to draw current from thermal flasher **21** should the turn signal switch **20** be actuated to indicate a right directional turn by the operator, and similarly to accept the pulsed turn signal output that was formerly connected to first brighter filament **14a** before the first light intensity switch **30** was energized. Operationally, this first dimmer filament **14b** becomes the surrogate or "new" turn signal filament, with the vehicle's turn signal circuitry rerouted to that same filament as long as first light intensity switch **30** is energized.

[0029] Rerouting of the vehicle's right turn signal output to the dimmer parking light filament causes the resistive load represented by the second dimmer filament **14b** to draw current from and help cause the alternating on/off output action of the thermal flasher **21** through the turn signal switch **20,** when same switch is actuated for a right directional turn and completes the circuit through right turn signal connector **20a**. It must be noted here that there is conventionally a right rear bulb with parking light, turn signal, and also brake light duties (not shown) wired in parallel with the front bulb. The thermal flasher **21** also sees the resistive load of the rear turn signal (brighter) filament in parallel with the second dimmer filament **14b** when first intensity light switch **30** is energized, in order that thermal flasher **21** will "sense" the combined total current load of the substitute front and normal rear right turn signal filament system.

[0030] Likewise, the second light intensity switch **50** of the embodiment shown in Figure 2 is a four pole, double throw switch such that is able to make and/or break potentially four connections between the second vehicular light **16** and both the parking/headlight switch **18** and the left turn connector **20b** of the directional turn-signal switch **20**. The second light intensity switch **50** is connected to the parking/headlight switch **18** via a parking light input connector **52** and parking light connector **17b,** and it is connected to the second dimmer filament **16b** via a parking light output connector **54**. The first light intensity switch **50** is connected to the left turn connector **20b** of the turn signal switch **20** through turn signal input connector **56** and turn signal connector **19b,** and it is connected to the second brighter filament **16a** through turn signal output connector **58**. When the second light intensity switch **50** is not energized (i.e., turned "off"), the light intensity switch **50** connects the turn signal input connector **56** with the turn signal output connector **58** via circuit path connector **53,** and the "normally closed" switched contact sets **50c** and **50d** of light intensity switch **50**. Also, when the second light intensity switch **50a** is "off", the light intensity switch **50** connects the parking light input connector **52** with the parking light output connector **54** using the "normally closed" internal switched contact set **50b** of light intensity switch **50.** The result is that, the second light intensity switch **50** in the non-energized state connects the second brighter light filament **16a** to its original turn signal connector **19b**, and connects second dimmer light filament **16b** to its original parking light connector **17b**. Hence, left vehicle light **16** is reconnected to its former vehicle connections while the intensity light switch **50** is not energized (i.e., turned "off").

[0031] When the second light intensity switch **50** is energized (i.e., turned "on"), the turn signal output connector **58** is connected to power source **12**; through ignition key switch **13** and fuse **15**, then through main power circuit connector **70**, through the "normally closed" switched

contact set **60b** of turn signal interrupt switch **60**, then through circuit path connector **55** and finally through the "normally open" switched contact set **50d** of light intensity switch **50**. As a result, when light intensity switch **50** is energized, the second brighter filament **16a** will be lit as long as the ignition key switch **13** is energized, and the turn signal interrupt switch **60** remains non-energized (i.e. stays "off"). Also, when the second light intensity switch **50a** is energized, the parking light output connector **54** is connected to turn signal input connector **56** using the circuit connector **51** and the "normally open" switched contact sets **50b** and **50c** of light intensity switch **50.** This results in the left turn signal connector **20b** of the turn signal switch **20** being connected to the second dimmer filament **16b** when the second light intensity switch **50** is energized. The second dimmer filament **16b** waits in the ready state to draw current from thermal flasher **21** should the turn signal switch **20** be actuated to indicate a right directional turn, and similarly to accept the pulsed turn signal output that was formerly connected to second brighter filament **16a** before the second light intensity switch **50** was energized. Operationally, this second dimmer filament **16b** becomes the surrogate or "new" turn signal filament, with the vehicle's turn signal circuitry rerouted to the second dimmer filament **16b** as long as second light intensity switch **50** is energized.

[0032] Rerouting of the left turn signal output of the vehicle to the second dimmer parking light filament **16b** causes the resistive load represented by the second dimmer filament **16b** to be detected by the thermal flasher **21** through the turn signal switch **20,** when same switch is actuated for a left directional turn and completes the circuit through left turn signal connector **20b**. It must be noted here that there is conventionally a left rear bulb with parking light, turn signal, and also brake light duties (not shown) wired in parallel with the front bulb. The thermal flasher **21** also sees the resistive load of the rear turn signal (brighter) filament in parallel with

the second dimmer filament **16b** when second intensity light switch **50** is energized, in order that thermal flasher **21** will "sense" the combined total current load of the substitute front and normal rear left turn signal filament system. Note that when intensity light switches **30, 50** are energized, the module **22** is considered to be "on", and how this happens will be further discussed herein.

[0033] The daytime running light module **22** additionally includes a first turn signal interrupt switch **40** and a second turn signal interrupt switch **60** that operate with the turn signal switch **20** to oscillate the brightness of the respective vehicular lights **14** and **16**. Each turn signal interrupt switch **40, 60** is preferably a single pole, double throw switch (such as a relay). Looking to the first turn signal interrupt switch **40**, the electromagnetic coil **40a** of turn signal interrupt switch **40** is connected to the turn signal input connector **36** through circuit connector **37**. The other end of coil **40a** is connected to ground **27**. When the turn signal switch **20** is actuated to indicate a right directional signal by completing the circuit at connector **20a**, the turn signal input connector **36** connects pulsed right turn signal input (or "signal") to the coil **40a** of first turn signal interrupt switch **40**.

[0034] The turn signal pulsed output from turn signal switch **20** causes the first turn signal interrupt switch **40** to initially energize; thus momentarily disconnecting the "normally closed" connection of contact set **40b** between the power source **12** and the turn signal output connector **38** (provided first intensity switch **30** is energized), whereas the turn signal output connector **38** is in turn connected to first brighter filament **14a**. The thermal flasher **21** then internally alternates between opening and closing a connection between the ignition key switch **13** and the turn signal switch contact **20a** of turn signal switch **20**. Furthermore, the oscillating signal from the thermal flasher **21** travels through turn signal switch **20** to turn signal input connector **36,** and through circuit connector **37** to alternately energize and relax the coil **40a** of turn signal interrupt

switch **40**. This causes the connection between the power source **12** and first brighter filament **14a** to be alternately reconnected and disconnected. During vehicle operation, the first brighter filament **14a** is energized or "on" when the output from turn signal switch **20** is "off", and the first brighter filament **14a** oscillates "off" when the output from turn signal switch **20** is energized or turns "on", then the cycle repeats. Thus, the first brighter filament **14a** is on, then pulses off, then on, and then repeats while the turn signal switch **20** is energized or "on".

[0035] As previously discussed, first dimmer filament **14b** is connected to be a substitute or replacement turn signal filament for the vehicle's existing turn signal system while first intensity switch **30** is energized. Since the first dimmer filament **14b** is connected by the energized module **22** to the turn signal input connector **36**, then the first dimmer filament **14b** energizes from the pulsed signal from thermal flasher **21** at the same time the first brighter filament **14a** is turning off. As stated earlier, the connection of turn signal input connector **36** to the first dimmer filament **14b** is helpful to present a current drain or "load" to thermal flasher **21** in order for same thermal flasher **21** to operate. In summary, when a right turn signal is applied while the daytime running light module **22** is operational, the corresponding vehicular light **14** changes from a constant bright output to a flashing output repeatedly, alternating between the first dimmer filament **14b** being energized and the first brighter filament **14a** being energized. That is, the first vehicular light **14** will oscillate between a bright light and a dimmed light during the turn signal operation to provide directional notice to other vehicle operators. It is by this manner that the right turn signal directional lighting emitted by vehicular light **14** is restored to the vehicle during the operation of the daytime running light module **22**.

[0036] Similarly, looking to the second turn signal interrupt switch **60**, the electromagnetic coil **60a** of second turn signal interrupt switch **60** is connected to the turn signal input connector

56 through circuit connector **57**. The other end of coil **60a** is connected to ground **27**. When the turn signal switch **20** is actuated to indicate a left directional signal by completing the circuit at connector **20b**, the turn signal input connector **56** connects pulsed left turn signal input (or "signal") to the coil **60a** of second turn signal interrupt switch **60.** The turn signal pulsed output from the turn signal switch **20** causes the second turn signal interrupt switch **60** to initially energize; thus momentarily disconnecting the "normally closed" connection of contact set **60b** between ignition key switch **13** and the turn signal output connector **58** (provided intensity switch **50** is energized), whereas the turn signal output connector **58** is in turn connected to second brighter filament **16a**. The thermal flasher **21** then internally alternates between opening and closing a connection between the i power source **12** and the turn signal switch contact **20b** of turn signal switch **20**. Furthermore, the oscillating signal from the thermal flasher **21** travels through turn signal switch **20** to turn signal input connector **56,** and through circuit connector **57** to alternately energize and relax the coil **60a** of turn signal interrupt switch **60.** This causes the connection between the power source **12** and second brighter filament **16a** to be alternately reconnected and disconnected. During vehicle operation, the second brighter filament **16a** is energized or "on" when the output from turn signal switch **20** is "off", and the second brighter filament **16a** oscillates "off" when the output from turn signal switch **20** is energized, or turns "on", then the cycle repeats. Thus, the second bright filament **16a** is on, then pulses off, then on, and then repeats while the turn signal **20** is energized.

[0037] As previously discussed, the second dimmer filament **16b** is connected to be a substitute or replacement turn signal filament for the vehicle's existing turn signal system while second intensity switch **50** is energized. Since the second dimmer filament **16b** is connected by the energized module **22** to the turn signal input connector **36**, the second dimmer filament **16b**

energizes from the pulsed signal from thermal flasher **21** at the same time the second brighter filament **16a** is turning off. As described earlier, the connection of turn signal input connector **56** to the second dimmer filament **16b** is helpful to present a current drain or "load" to thermal flasher **21** in order for same thermal flasher **21** to operate. In summary, when a left turn signal is applied while the daytime running light module **22** is operational, the corresponding vehicular light **16** changes from a constant bright output to a flashing output, repeatedly alternating between the second dimmer filament **16b** being energized and the second brighter filament **16a** being energized. That is, the second vehicular light **16** will oscillate between a bright light and a dimmed light during the turn signal operation to provide directional notice to other vehicle operators. It is by this manner that the left turn signal directional lighting emitted by vehicular light **16** is restored to the vehicle during the operation of the daytime running light module **22**.

[0038] The daytime running light module **22** may additionally include an automatic override switch **80** that automatically deactivates first and second light intensity switches **30, 50** when the parking light/headlight switch **18** is in either the parking light only position **18a** or the headlight-plus-parking light position **18b**. The automatic override switch **80** is desirable to reduce the illumination of the vehicular lights **14**, **16** back to their normal output during certain nighttime hours when brighter vehicle lights **14, 16** are not desired or needed.

[0039] The embodiment of the daytime running light module **22** such as shown in Figure 2 includes the automatic override switch **80**, preferably a single pole, double throw switch, such as a relay. The "normally closed" contact set **80b** of automatic override switch **80** allows the power supply **12** to energize the respective coil inputs **30a, 50a** of the first and second light intensity switches **30**, **50**, as long as automatic override switch **80** remains "off". Again looking at Figure 2, the power supply **12** connects to the ignition key switch **13** and to main power circuit

connector **70**, then through main module power switch **90** (provided same switch is closed, further discussed herein), through circuit connector **75,** through the "normally closed" contact set **80b** of automatic override switch **80,** and then to auxiliary power circuit connector **71**, which in turn is connected simultaneously to both coil inputs **30a, 50a** of the first and second light intensity switches **30, 50.** This connection causes the module **22** to turn "on" when the ignition key switch **13** is energized, as light intensity switches **30, 50** being energized is the state where the module is considered to be "on". The electromagnetic coil **80a** of automatic override switch **80** is connected to parking light/headlight switch **18** in the following manner: through parking light connector **17a,** parking light input connector **32**, then circuit connector **39**, through a manual night override switch **84** (provided the same switch is closed), then through circuit connector **77**, and then to coil **80a** of automatic override switch **80**. The other side of coil **80a** is connected to ground **27**. Activation of the parking light/headlight switch **18** will energize the coil **80a** of the automatic override switch **80,** provided the manual night override switch **84** is closed. When the parking lights are turned on, the automatic override switch **80** energizes and breaks the connection between ignition key switch **13** and the coils **30a, 50a** of the first and second light intensity switches **30, 50**. As a result, the first and second light intensity switches **30, 50** are not energized, and are effectively turned "off". Consequently, the daytime running light module **22** will be deactivated, and the vehicular lights **14, 16** will operate as originally connected by the vehicle manufacturer. Many conventional factory-installed daytime running light systems currently operate this way, turning "off" as the vehicle lights turn "on".

[0040] In the situation where the operator wishes to deactivate the automatic override switch **80**, the manual night override switch **84** mentioned earlier is connected between parking light source voltage from parking light input connector **32** and coil **80a** of automatic override switch

80. The inclusion of this automatic overrule switch **80** is desired when additional light and roadway visibility is desired, as in fog or hazy conditions; persons with decreased night vision may also desire the additional night lighting. The manual night override switch **84** is a standard single pole, double throw switch with an off or "rest" position. When the parking lights are "on" and the manual night override switch **84** is closed, the module **22** goes into night override, thereby turning the module "off" and reconnecting the vehicular lights **14, 16** to their factory wiring. However, when the manual night override switch **84** is switched open (i.e. breaking the potentially closed circuit) while the parking lights are "on", the connection between the automatic override switch **80** and the first and second light intensity switches **30**, **50** will be reconnected (i.e. as during daytime operation), such that the vehicular lights **14, 16** will continue to have a brighter illumination. The optional "night mode" state provided by the manual night override switch **84** is controlled exclusively by the operator of the vehicle. It potentially enhances both the operator's visibility at night, during dusk and dawn, and also during night/fog or night/rain conditions. Additionally, it increases the vehicle's outward visibility with respect to other vehicle operators more clearly seeing same vehicle during less than optimum environmental conditions. Factory systems lack this functionality, turning "off" as the parking lights come on.

[0041] Previously mentioned, a main module power switch **90** may be included in the present invention to allow the user to control the operation of the first and second light intensity switches **30**, **50**. In particular, the main module power switch **90** is preferably a conventional single pole, double throw switch (with an off or "rest" position) that connects between the ignition key switch **13** and the first and second light intensity switches **30**, **50**. Thus, when the main module power switch **90** is closed, the connection between the ignition key switch **13** and

the electromagnetic coils **30a**, **50a** of the first and second light intensity switches **30**, **50** is maintained. The connection itself is from the ignition key switch **13** to main power circuit connector **70**, then through main module power switch **90** (provided same switch is closed), through circuit connector **75,** through the "normally closed" contact set **80b** of automatic override switch **80,** and then to auxiliary power circuit connector **71**, which in turn is connected simultaneously to both coil inputs **30a, 50a** of the first and second light intensity switches **30, 50.** Conversely, when the main module power switch **90** is open, the connection between the ignition key switch **13** and the first and second light intensity switches **30, 50** will be broken. In this case the daytime running light module **22** will not control the vehicular lights **14, 16,** allowing them to reconnect to their original or factory connections and resulting in the same operational functioning of vehicular lights **14, 16** without the control of the daytime running light module **22.** Factory daytime running light systems also lack this functionality, and such a control feature is particularly advantageous to a game hunter, who uses his vehicle to enter the woods during early morning hours and is trying not to draw attention to same vehicle upon arrival.

[0042] The present invention includes an operational indicator **96**, such as a two input, three color light emitting diode. The operational indicator **96** provides feedback or notice to the user concerning the operational state of the daytime running light module **22** at all times. The operational indicator **96** includes two "dropping" resistors **98,** and has a negative terminal that is connected to ground **27**. One of these resistors **98** is connected in-line with the first input of the indicator and the circuit connector/output **99,** thus causing the light emitting diode to illuminate green when 12 volts is present at circuit connector/output **99**. The other resistor **98** is connected in-line with the second input of the diode and circuit connector/output **97,** thus causing the light emitting diode to illuminate red when 12 volts is present at circuit connector/output **97**. These

resistors **98** reduce or "drop" the 12-volt output from the module circuit connector/outputs **99, 97** to about 2 volts, such as is required by the light emitting diode, or commonly known as a LED.

[0043] When the operational indicator **96** is illuminated green, the daytime running light module **22** is "on". This occurs only if both the vehicle's ignition key switch **13** and the module **22** itself are both "on". The ensuing connection is from ignition key switch **13** to main power circuit connector **70**, then through expandability loop **74,** through circuit connector/output **76**, through the "normally open" contacts of contact set **50e** of energized light intensity switch **50**, then through circuit connector/output **99**, then to resistor **98** and on to operational indicator **96**. Note that second intensity light switch **50** must be energized to allow the circuit connector/output **99** to produce an output. Such can occur only if the module **22** is "on", as the completed circuit supplying voltage to circuit connector/output **99** is disconnected at contact set **50e** of light intensity switch **50** when the module **22** is "off".

[0044] When the operational indicator **96** is illuminated orange, then the daytime running light module **22** is uniquely "on" while the parking lights (and/or headlights **11**) are also turned on. This orange LED output represents the manually canceling of the nighttime override function of the module, and is accomplished by manually switching the manual night override switch **84** "open", as previously described. Orange illumination from the LED only occurs when both the green and red illumination of the operational indicator **96** are energized simultaneously. When the module **22** is in this mode, one half of the dual LED input connection itself is from the ignition key power source **12**, through ignition key switch **13** to main power circuit connector **70**, then through expandability loop **74,** through circuit connector/output **76**, through the "normally open" contacts of contact set **50e** of energized light intensity switch **50**, then through circuit connector/output **99**, then to resistor **98** and on to operational indicator **96**, producing the green

illumination. At the same time, parking light voltage enters the module **22** at parking light input connector **32**, through circuit connector **39,** through the "normally open" contacts of contact set **30e** of energized light intensity switch **30**, then through circuit connector **73**, through expandability loop **72,** then to circuit connector/output **97**, then to resistor **98** and on to operational indicator **96**, producing the red illumination. Both primary colors of illumination energized at the same time yield the orange illumination that indicates the module's nighttime "on" state. Note that both intensity light switches **30** and **50** must be energized, and the parking lights must also be on to allow the circuit connector/outputs **99** and **98** to be energized at the same time. Such a situation occurs only if the module **22** is "on" and the parking lights are "on" simultaneously.

[0045] When the operational indicator **96** is illuminated red, then the daytime running light module **22** is "off". This occurs in two cases: when the main power switch **90** is switched off, or when the automatic night override **80** switch has automatically turned the module "off" because the parking lights (and/or headlights **11**) are turned "on" (via a closed circuit connection at manual night override switch **84**). In either case, the operational indicator **96** receives power by connecting the power source **12** through ignition key switch **13** to main power circuit connector **70**, then through expandability loop **74,** through circuit connector/output **76**, through the "normally closed" contacts of contact set **50e** of light intensity switch **50**, then through circuit connector/output **97**, then to resistor **98** and on to operational indicator **96**, producing the red illumination. Note that second intensity light switch **50** must be "off" to allow the circuit connector/output **97** to produce such an output. Such can occur only if the module is "off" and the ignition key is "on".

[0046] Finally, if the operational indicator **96** has no illumination at all, then the daytime running light module **22** has lost a connection to the ignition key switch **13**, has blown fuse **15,** or has lost ground connection **27**. Since the illumination states of the operational indicator **96** are accomplished using switched contact logical feedback from one or both of contact sets **30e, 50e** on each of the intensity switches **30, 50,** it can be said that the operational indicator **96** uses active feedback to inform the vehicle operator as to the operating state of the module **22** at any given moment.

[0047] In the embodiment of the daytime running light module **22** illustrated in Figure 3, the design of the daytime running light module **22** has been simplified to include only a main module power switch **90** to control operation of the module **22**. The "automatic" day and night switching functionality from the module **22** as shown in Figure 2 has been removed, and control of the module **22** is operator dependent. That is, the operator determines when the additional light is required, and may do so anytime the ignition key switch **13** is "on". When the manual operation running light module **22** is desired, the operator simply turns the main module power switch **90** on, which in turn connects the module **22** with the ignition key switch **13** and the power source **12**. Specifically, ignition key switch **13** connects main power circuit connector **70** to one side of main module power switch **90,** which when "closed" connects to auxiliary power circuit connector **71a**, which in turn is connected simultaneously to both coil inputs **30a, 50a** of the first and second light intensity switches **30, 50.**

[0048] Comparing Figures 2 and 3, the automatic override switch **80** and the manual night override switch **84** are removed from Figure 2 to achieve the embodiment of the manual operation running light module **22** illustrated in Figure 3. This is due to the fact that there is no need for automatic operation in the embodiment of the "on demand" manual operation running

light module **22** shown in Figure 3. There are some automobile operators who dislike daytime running lights for various reasons, but purchase and utilize aftermarket fog lights on their vehicle, as long as same operator can control where and when these auxiliary lights are energized. The embodiment illustrated in Figure 3 is a simplified or economy version of the daytime running light module **22** that provides the operator with total control of the vehicular lights **14, 16**. That is, this embodiment allows the user to manually determine when the vehicular lights **14, 16** will have a brighter illumination while the vehicle is in operation.

[0049] Looking now to Figure 4, another embodiment of the daytime running light module **22** is illustrated. This module **22** of this embodiment is considered to be a commercial vehicle or "fleet" version. That is, for a single vehicle or fleet of vehicles that typically operate in the daytime, there is little need for the operator of such a vehicle to interface with and control the module **22**. Therefore, the module **22** is allowed to function completely automatically. Here, the operational indicator **96** is built into the module **22** at the circuit board level, and a second optional operational indicator **96a** is mounted where the operator can see the operational states of the module **22**. The previous vehicle operator switching **90**, **84**, as found in Figure 2, are now replaced by two loops **83** and **89**. The first is a main power loop **89,** and the second loop is a night override loop **83**. The embodiment of the module **22** shown in Figure 4 most closely operates like a factory system. That is, the module **22** is energized when the vehicle lights are off, and the module **22** is "off" at night when the vehicle lights are on. Moreover, this embodiment is lacking the controls to turn the daytime running lights "off" when the vehicle is running, and it is also lacking the controls to turn the daytime running lights "on" anytime the parking lights and/or headlights **11** are activated.

[0050] Many imported vehicles typically have a different parking light/turn light configuration, similar to that shown in Figure 5. These vehicles use separate parking light bulbs **4, 6** containing dimmer bulb filaments **4a, 6a**. Such vehicles then utilize additional but separate turn signal bulbs **24, 26** containing brighter filaments **24a, 26a**. Vehicles with this type of arrangement may utilize the parking light bulbs **4, 6** to be both forward projecting parking lights for oncoming traffic, and to also be the front lighted side marker lights for traffic approaching the vehicle from the side. More will be discussed about this further herein.

[0051] Another uniquely different parking light/turn light configuration can be found in some luxury vehicles, and/or in vehicles where the styling of the front lighting system is emphasized. Such a system is shown in Figure 6, where two dual filament bulbs are utilized for each side of the front of the vehicle. Bulbs **14** and **44** are wired together in parallel for the front right side of the vehicle, as shown. Bulbs **16** and **66** are wired similarly for the front left side of the vehicle. Note that this type of system nearly always uses a specially designed flasher **21a** that is designed specifically for the additional current loads presented by the addition of bulbs **44** and **66**.

[0052] Figure 7 shows the daytime running light module **22** integrated into an imported vehicle as discussed in Figure 5. Additionally, the daytime running light module **22** has been designed with expandability in mind, and has the ability for both minor and major expandability events. Figure 7 shows a minor expandability event, using the active feedback signals that normally feed to the operational indicator **96**. In this case, it is necessary to include an auxiliary, 12-volt single pole, double throw expansion switch **78** (such as a relay) as shown. In this example, the vehicle possesses driving lights **7** that are supplied control voltage from a source connector **8**. The source connector **8** is interrupted, and source feed circuit connector **8a** and

light connector **8b** are connected back to expansion switch **78** using two strand 18-gauge shielded cable **23b**. The light connector **8b** is connected to the "common" switched terminal of contact set **78b**, and the source feed connector **8a** is connected to the "normally closed" switched terminal of contact set **78b**. This causes the driving lights **7** to be connected to their normal factory connection as long as expansion switch **78** remains non-energized or in the "off" position. The "normally open" switched terminal of contact set **78b** is connected to power source **12** through auxiliary fuse **9**, and one side of coil **78a** is connected to circuit connector/output **99**. The other side of coil **78a** is connected to ground **27**. Subsequently, when the operational indicator **96** is illuminated green (i.e. the module is "on"), 12 volts supplied from circuit connector/output **99** energizes expansion switch **78** and forces driving lights **7** to be activated, regardless of the state of source connector **8**.

[0053] As mentioned previously, some imported vehicles utilize the parking light bulbs **4, 6** as shown in Figure 5 to be both forward projecting parking lights for oncoming traffic, and also to be the front lighted side marker lights for traffic approaching the vehicle from the side. In this specific instance, the connection of the daytime running light module **22** in its normal configuration will connect the original parking light filaments **4a, 6a** as surrogate or substitute turn signal bulbs, with the vehicle's turn signal circuitry rerouted to those same filaments as long as the daytime running light module **22** is energized. When the parking lights are off, this feature of the module **22** is advantageous because when a turn signal is activated, both high and low intensity bulbs on that side of the vehicle alternate energizing on and off. When the parking lights are activated and the module **22** is "on", however, this is a disadvantage because the parking light output from the vehicle is no longer connected to the parking light bulbs **4, 6**. Since U.S. law has required lighted side markers on vehicles since 1968, defeating these lights by the

module's normal American vehicle operation is unacceptable, and an adaptation to correct for this is necessary.

[0054] Figure 8 shows such an adaptation, and in this case it is necessary to include two secondary light switches **120, 140** preferably single pole, double throw switches (such as relays). For the right parking light side, parking light source voltage from parking light input connector **32** is connected to both one end of coil **120a** and the "normally open" terminal of contact set **120b** of secondary light switch **120** via external circuit connector **32a**. The other end of coil **120a** of secondary light switch **120** is connected to ground **27**. The parking light input connector **34** of first intensity light switch **30** is connected to the "normally closed" terminal of contact set **120b** via external circuit connector **34b**. Also the "common" terminal of contact set **120b** of secondary light switch **120** is connected to the dimmer filament **4a** of parking light bulb **4** via external circuit connector **34b**. At times when the parking lights are "off", the normal connection of the module **22** between parking light input **34** and parking light dimmer filament **4a** is restored through the contact set **120b** as long as secondary light switch **120** is relaxed or non energized. When the parking lights are activated, the secondary light switch **120** is energized and connects parking light voltage from external circuit connector **32b** through contact set **120b** and external circuit connector **34b** to energize dimmer filament **4a** of parking light bulb **4**.

[0055] For the left parking light side, parking light source voltage from parking light input connector **52** is connected through to both one end of coil **140a** and the "normally open" terminal of contact set **140b** of secondary light switch **140** via external circuit connector **52a**. The other end of coil **140a** of secondary light switch **140** is connected to ground **27**. The parking light input connector **54** of second intensity light switch **50** is connected to the "normally closed" terminal of contact set **140b** via external circuit connector **54b**. Also the "common" terminal of contact

set **140b** of secondary light switch **140** is connected to the dimmer filament **6a** of parking light bulb **6** via external circuit connector **54b**. At times when the parking lights are "off", the module's normal connection of the module **22** between parking light input **54** and parking light dimmer filament **6a** is restored through the contact set **140b** as long as secondary light switch **140** is relaxed or non-energized. When the parking lights are activated, the secondary light switch **140** is energized and connects parking light voltage from external circuit connector **52b** through contact set **140b** and external circuit connector **54b** to energize dimmer filament **6a** of parking light bulb **6**. Also, the secondary light switches **120**, **140** could optionally be built into the module **22** at the circuit board level for imported cars.

[0056] Notice in Figure 8 the normal factory thermal flasher **21** has been replaced what is commonly known as a heavy-duty trailer flasher **21b**. A variable load factory thermal flasher **21** is typically designed for the current requirements of two turn signal filaments: one bright filament for a front bulb, and one bright filament for rear bulb (this is not always the case, as original equipment flashers are designed for the number of bulbs built into the specific vehicle in question). When one of these filament burns out, then the current flowing through the factory thermal flasher **21** changes, and the rate of flash of the simple device either increases (i.e., a fast or rapid flash condition), or freezes in the "on" or always connected (i.e., no flash) state. This is to signal the vehicle operator that a bulb-out condition exists on that specific side of the vehicle, as indicated by the system function change on the affected side. Optionally replacing the factory thermal flasher **21** with a widely available and inexpensive heavy-duty trailer flasher **21b** is very common when a vehicle is used to tow a trailer, or when the flasher itself burns out. When a trailer is towed behind a vehicle, brake and turn signal lights on the trailer are connected to the vehicle's lighting system. This causes the factory flasher **21** in many cases to falsely signal a

bulb-out condition, hence the need for a heavy-duty trailer flasher **21b.** When a flasher burns out or otherwise fails, all that is typically commercially available are heavy-duty trailer flashers. Such heavy-duty trailer flashers have no bulb-out notice capacity, and flash constantly with either one filament or any number of filaments present. In some cases, integration of the daytime running light module **22** into a vehicle with the module's rerouting of the turn signal circuitry to the parking light filaments is self correcting, with no need for flasher replacement. In the case of a fast flashing bulb-out condition occurring due to the addition of the daytime running light module **22**, replacing the factory flasher with a heavy-duty trailer flasher **21b** solves this problem in a very high percentage of cases. With the absence of connection to the parking light filaments in the night operation as described above and shown in Figure 8, such flasher replacement as described is necessary.

[0057] The embodiment shown in Figure 9 shows the module **22** integrated into a four bulb eight filament system, as shown in Figure 6. The factory thermal flasher has been replaced with a heavy-duty trailer flasher **21b** in Figure 9, as described above, to compensate for the resistive load drop of two lower resistance filaments (i.e., a lower resistance filament equals higher light output) having been replaced in the turn signal system by the higher resistance parking light filaments. Figure 9 additionally shows another minor expandability event, in this instance to turn "off" factory white daytime running lights **47** when the module activated amber daytime running lights are energized or turned "on". Again it is necessary to include an expansion switch **78,** such as a single pole, double throw switch (such as a relay). The vehicle possesses white factory daytime running lights **47** that are supplied control voltage from source connector **48**. The source connector is intercepted, and source feed circuit connector **48a** and light connector **48b** are connected back to expansion switch **78** using two strand 18 gauge shielded cable **23b**. The light

connector **48b** is connected to the "common" terminal of contact set **78b**, and the supply feed connector **48a** is connected to the "normally closed" terminal of contact set **78b**. This causes the white factory driving lights **47** to be connected to their normal source connector **48** as long as expansion switch **78** remains non-energized or in the "off" position. The "normally open" terminal of contact set **78b** has no connection. One side of coil **78a** is connected to circuit connector/output **99**. The other side of coil **78a** is connected to ground **27**. Subsequently, when the operational indicator **96** is illuminated green from 12 volts being supplied from circuit connector/output **99** (i.e. the module is "on"), then the expansion switch **78** is energized and forces the white factory daytime running lights **47** to be deactivated, regardless of the state of source connector **48**.

[0058] Occasionally, a vehicle's factory thermal flasher **21a** is designed in such a fashion that it cannot be replaced with a heavy duty trailer flasher **21b**, as previously discussed. The embodiment in Figure 10 shows such a case where a two part bulb resistance compensation circuit has been added. The compensation circuit shown consists of a heat sink resistor pack **100a** mounted in the engine compartment, and a compensation switch-diode pack **100b** mounted under the dash along with the daytime running light module **22**. The heat sink resistor pack **100a** consists of two bulb compensation resistors **104** and **106**, and two thermostats **107** and **108**, all mounted in an aluminum heat sink **101**. The compensation switch-diode pack **100b** consists of a compensation switch **102** (such as a relay), and two diodes **109** and **110**. All connections between heat sink resistor pack **100a** and compensation switch-diode pack **100b** are made using four strand 18-gauge wire **23c**.

[0059] One end of the coil **102a** of compensation switch **102** is connected to circuit connector/output **99**. The other side of coil **102a** and the "normally open" terminal in contact set

102b of compensation switch **102** are both connected to ground **27**. The "common" terminal of contact set **102b** of compensation switch **102** is connected through diodes **109** and **110** to the one end of compensation resistors **104** and **106** inside the heat sink resistor pack **100a**. The other end of first compensation resistor **104** is connected to parking light output connector **34** through thermostat **107**. The other end of second compensation resistor **106** is connected to parking light output connector **54** through thermostat **108**. The compensation resistors **104** and **106** operate to provide secondary bulb resistance to the turn signal circuitry in addition to the resistance offered to the same circuitry by the rerouted dimmer parking light filaments, provided three conditions exist: when the module **22** is "on", when compensation switch **102** is energized because of output from circuit connector/output **99**, and when one of the turn signals are "on". When the module **22** is "off", compensation resistors **104**, **106** cannot add resistance as described above because they are not able to receive a ground connection, since compensation switch **102** is not energized. Additionally, the diodes **109**, **110** isolate the compensation resistors **104**, **106** from connecting to each other and draining parking light energy when the vehicles parking lights are "on" and the module is "off". When energized, the byproduct of the compensation resistors **104**, **106** is heat, and the aluminum heat sink **101** is utilized to dissipate this heat. The thermostats **107**, **108** are present to break the compensation resistors **104, 106** respective circuit connection and prevent thermal runaway should the right or left turn signal be mistakenly be left on for a long time while the module **22** is "on".

[0060] As mentioned previously, the module **22** has the ability for a major expandability event. An example of such expandability is shown in Figure 11. For a major expandability event, the module has two expandability loops **72, 74** that when cut allow the entire contact set **50e** in second intensity light switch **50** to be accessed by the system integrator/installer. This spare

arrangement and utilization of a "normally closed", "normally open", and "common" internal contacts is typically referred to as called "dry contacts" in the burglar alarm industry. These contacts, which were previously "wet" with voltage, become "dry" or without voltage due to the cutting of the two expandability loops **72, 74.** The module now has the ability to switch powers or grounds, provided the accessories or devices being switched draw less than or up to 6 amps, as the module is currently designed. The module **22** shown is the manual version as previously described in Figure 3. Expandability loops **72** and **74** are cut, and power from main power circuit connector **70** that feeds main power switch **90** is also connected to circuit connector/output **99**. In this example, the ignition keyed positive lead **3b** from car stereo **3** is connected to expandability lead **76**. Car stereo's battery positive lead **3a** is connected to power source **12**, and the same car stereo **3** is connected to vehicle chassis ground **26**. When the module **22** is "off", power to ignition keyed positive lead **3b** of car stereo **3** is not connected due to the contact set **50e** in second intensity light switch **50** being relaxed, and car stereo **3** cannot turn "on". When the module is "on", power to ignition keyed positive lead **3b** of car stereo **3** is connected due to the contact set **50e** in second intensity light switch **50** because second intensity light switch **50** is energized. When expandability loops **72, 74** are cut, the formerly shown operational indicator **96** is not utilized. Such a configuration might be advantageous when the vehicle is taken to the car wash, and/or the car dealership service center. Turning the module **22** "off" at the car wash keeps the daytime running lights from operating while the vehicle is going through the wash, and keeps the car wash attendants from playing the stereo loudly while the vehicle is being cleaned. At the service center, turning the module "off" keeps the dealership from attempting to repair turn signal lights that are stuck "on" and therefore must be "damaged" and in need of repair. It also

keeps service personnel from playing the stereo loudly, potentially damaging speakers. This is only one example of a major expandability event that is possible using module's "dry contacts".

[0061] It should further be noted that while the present invention discloses the use of relay switches, the switches of the present design could theoretically be replaced with electronic switching, such as solid state relays or their equivalent. As designed, relay switching is more robust and less subject to semi-conductor failure.

[0062] Thus, although there have been described particular embodiments of the present invention of a new and useful DAYTIME RUNNING LIGHT MODULE AND SYSTEM, it is not intended that such references be construed as limitations upon the scope of this invention except as set forth in the following claims.